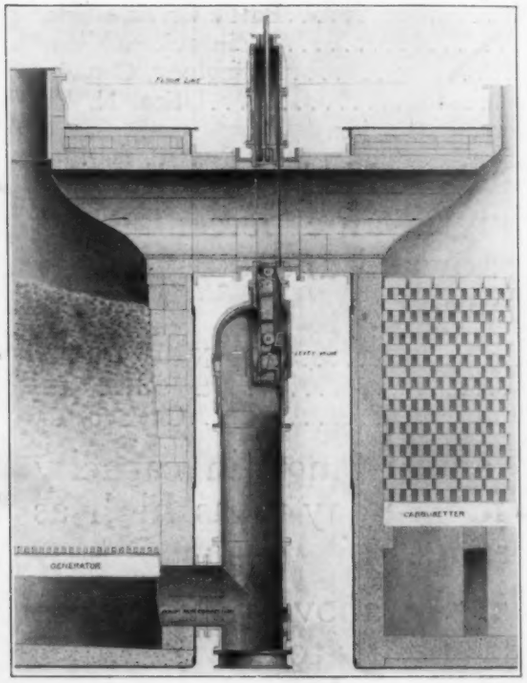
American
GAS JOURNAL
Formerly American Gas Light Journal
EST. 1859
VOL. 118, No. 21
WHOLE NO. 3188.
NEW YORK, SATURDAY, NOVEMBER 17, 1923
Subscription $5 per year in Canada $6 Foreign

Library of Congress
NOV 19 1923
Smithsonian Deposit



LEVEY TYPE OF HOT VALVE FOR CARBURETTED WATER GAS SETS

Built in all sizes either hand or hydraulic operating mechanism.

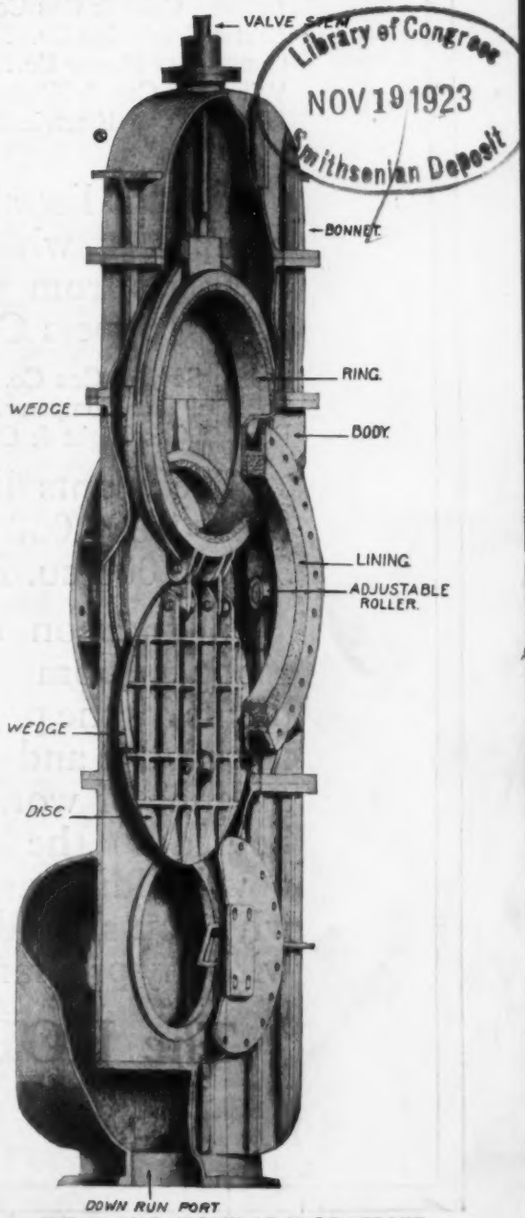
Performs in one valve and with one disc, the functions taken care of by the old style of Hot Valves, which made necessary two (2) valves per machine.

Adjustable wedges make it possible to keep the valve tight at all times and insure proper operation of sets.

The BARTLETT HAYWARD CO.

Engineers and Founders

BALTIMORE **NEW YORK**



VALVE DISC SHOWN AT HALF STROKE

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Experience

Below is given a list of the gas companies which have built or are building Koppers Coal Gas Plants:

Laclede Gas Light Co.	St. Louis, Mo.
Providence Gas Company	Providence, R. I.
Public Service Gas Co.	Camden, N. J.
Indiana Coke & Gas Co.	Terre Haute, Ind.
Battle Creek Gas Co.	Battle Creek, Mich.*
Consumers Power Co.	Zilwaukee, Mich.*
Winnipeg Gas & Electric Co.	Winnipeg, Canada*
Utica Gas & Electric Co.	Utica, N. Y.*

*Under construction.

To this list should be added the following companies which buy a large percentage of their gas from plants owned and operated by The Koppers Company:

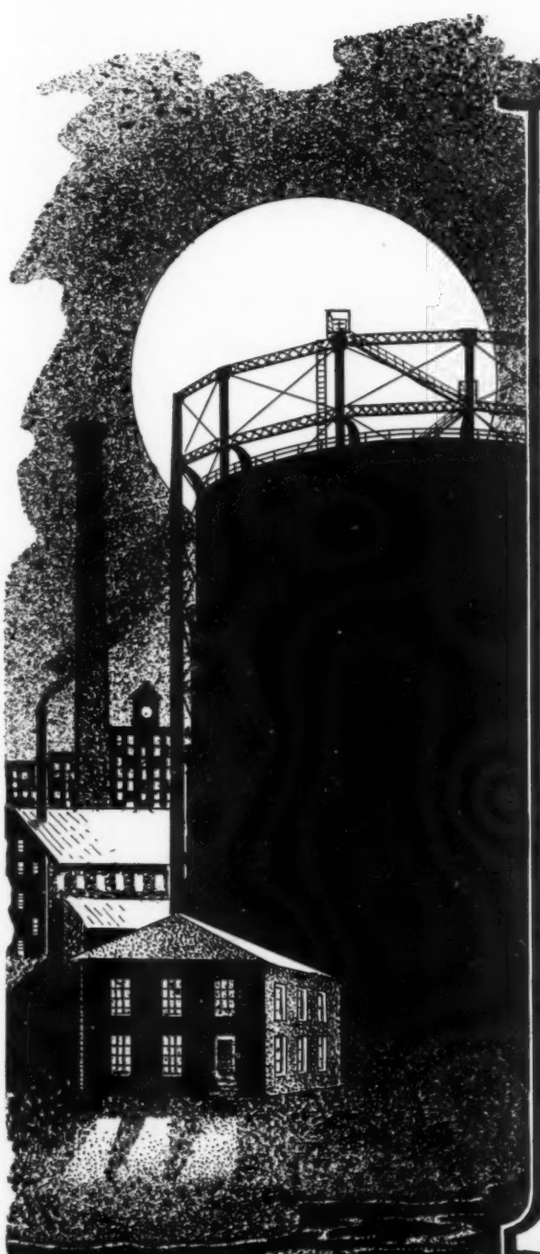
Public Service Gas Co.	Newark, N. J.
St. Paul Gas Company	St. Paul, Minn.
Peoples Gas Light & Coke Co.	Chicago, Ill.

The plants listed above range in capacity from 1,000,000 cu. ft. per day to as high as 30,000,000 cu. ft. per day.

In addition to the list above given, The Koppers Company has built a total of 39 other plants for the production of coke and gas. The knowledge and experience gained in this vast amount of work is at your service. It is embodied in the coal gas plants which we are now building and is a most convincing reason why you should consult us before going ahead with any program for increasing your gas output.

The KOPPERS COMPANY

Pittsburgh **Chicago**



72 Years Ago

In 1851, just as the gas industry was gaining its impetus, we became established. Since then we have been inseparably identified with the manufacture of gas.

Our earliest gas holders and structural iron and plate work were used in the construction of the following "Old Timers," prior to 1868:—

Cincinnati Gaslight Co.
Cleveland, O., Gas Co.
Davenport, Iowa, Gas Co.
Nashville, Tenn., Gas Co.
Madison, Ind., Gas Co.
Covington, Ky., Gas Co.
Baton Rouge, La., Gas Co.
Indianapolis, Ind., Gas Co.
Dayton, Ohio, Gas Co.
Terre Haute, Ind., Gas Co.

Few, if any, of the active members of the American Gas Assn. which met in convention at Atlantic City, can remember these old companies in their early struggles, nor the old gas holders, but many are familiar with the *more than a thousand gas holders* of later years that we have built on the reputation won by those earlier structures.

THE STACEY MANUFACTURING Co.
CINCINNATI, OHIO.

J. FRANK STACEY, *Pres & Gen. Mgr.* EDW. J. BAECHLE, *Sec. & Treas.*
THOS. C. RANSHAW, *Vice. Pres.* GEO. H. CRESSLER, *Gen. Sales Mgr.*

American Gas Journal

SIXTY FIFTH YEAR

Published Weekly by American Gas Light Journal, Inc., 53 Park Place, New York, N. Y.

S. G. KRAKE, Pres. & Treas. C. S. MYERS, Vice-Pres. A. M. GLEASON, Sec'y.

STANTON G. KRAKE, Managing Editor

ISMAR GINSBERG, Technical Editor

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Subscription $3.00 per year, including postage, in the United States, Mexico, Cuba, Porto Rico, Hawaii or the Philippines; in Canada, $4.00; foreign, $5.00—Single Copies, 10 cents.

AMERICAN GAS JOURNAL, November 17, 1923. Vol. 119. No. 24. Published weekly by American Gas Light Journal, Inc., New York, N. Y. Entered as second-class matter Jan. 9, 1917, at the post-office at New York, N. Y., under the Act of March 3, 1879.

AMERICAN
GAS JOURNAL

Vol. 119. No. 24 NEW YORK, NOVEMBER 17, 1923 Whole No. 3436

The Fuel of the Future. What Shall It Be?

V. Combustion of gas. Flame temperature. Calculation of flame temperature. Its importance in furnace capacity and efficiency

Ismar Ginsberg, B. Sc., Ch. E.

IN THE previous two articles on the combustion of gas, the writer sought to lay down the fundamental principles and rules of gaseous combustion and to define the various terms and units that are used in the science of combustion. A number of elementary calculations were also given with the purpose of demonstrating the application of these rules and principles in a practical way to gas. All this preliminary matter is essential before it is possible for the gas man to apply his fuel to the solution of various domestic and industrial heating problems. If it is desired to melt a mass of metal, it is first necessary to know how much heat will be required for this purpose and how much heat is available in a unit quantity of the fuel, gas, so that a calculation of the quantity of gas necessary to accomplish the fusion of the metal can be made. Then again when considering the problem of heating a house with gas, the various thermal characteristics of gas and the heating medium—air, in the case of the hot air furnace, water, in the case of the hot water furnace or the steam heat furnace—must be known, and their action must be understood so that it is possible to determine just how many heat units are required and how many can be derived from the fuel.

There are, however, two more matters that require our attention before we can proceed with the discussion of each and every heating problem, wherein gas can be or is being used as a fuel. These are the flame temperature and the recuperation and regeneration of heat. Both are of vital importance in thermal science and must be taken into careful consideration in the study of any heating problem.

The Temperature of the Flame

The first matter that demands our attention is the definition of flame temperature. We are speaking here of the theoretical flame temperature, that is, the temperature of the products of combustion which is caused by the heat developed during the combustion of the fuel, under the assumption that all the heat is utilized to raise the temperature of the combustion gases. In other words, no heat is assumed to go to loss through radiation, convection or conduction. If we know the quantity of heat that is contained in a unit weight or unit volume of the fuel, and the quantity of the products of combustion that are obtained from unit quantity of fuel, as well as the specific heat of the combustion gases, it is a comparatively easy matter to calculate the temperature of the combustion gases, that is, the flame temperature.

Calculation of Flame Temperature

Let us assume that we have a manufactured gas, whose analysis is as follows: methane 40 per cent, ethylene 4.00 per cent, carbon dioxide 0.50 per cent, carbon monoxide 6.00 per cent, hydrogen 46.00 per cent, oxygen 0.50 per cent, nitrogen 1.50 per cent and water vapor 1.50 per cent. This is the same gas that was used in calculating the calorific power and the volume of the products of combustion, as described in previous articles.

It was found therein that the gross heating value of this gas was 636.6 B. T. U. per cubic foot under the standard conditions of 60 degrees F and 29.91 inches of mercury, atmospheric pressure. It will be recalled that a distinction was made between the gross and the net heating value of a fuel. The gross heating value includes the heat that is used in vaporizing the

water that is present in the original gas as well as that produced in its combustion; in other words, the latent heat of vaporization. The net heating value of the gas is found by subtracting from the gross heating value the quantity of heat that is required to vaporize the total water content of the gaseous products.

It is easy to see that the temperature of the flame will be dependent only on the sensible heat of the gases produced in the combustion. While a part of the heat value of the fuel may have been consumed in vaporizing the water contained in it and formed during combustion, this heat is non-active as far as the temperature of the flame is concerned, for it is consumed, as latent or hidden heat, in changing water from the liquid to the vapor state.

Finding the Net Heating Value of the Sample Gas

Any of the ingredients of the gas that contain hydrogen, which includes the gas hydrogen as well, will on burning form a certain definite amount of water vapor. At the temperature of combustion, which is above 212 degrees F, the boiling point of water—the water is present in the vapor form and the conversion of water to vapor consumes part of the generated heat—the inherent heat value of the gas. For every pound of water that is evaporated there will be consumed 970.4 B. T. U. In the combustion of the gas, the analysis of which is given above, there will be evolved 1,355 cu. ft. of water vapor per cubic foot of gas burned. (For details of this calculation, see previous article). Inasmuch as every cubic foot of water in the form of steam at 212 degrees F weighs 0.03732 pound, the heat consumed in vaporizing that amount of water is equal to 36.2 B. T. U. per cubic foot (970.4x0.03732). Inasmuch as there are 1,355 cubic feet of water evolved in vapor form, the total heat consumed is equal to 1.355x36.2, or 49.0 B. T. U. per cubic foot. However, this volume is figured at 212 degrees F and atmospheric pressure, and hence it must be converted to 60 degrees F and 30 inches of mercury. One cubic foot of water at 212 degrees F will have a volume of 520/672 of a cubic foot, or 0.775 cubic foot. Hence the B. T. U. consumed in vaporizing 1.355 cubic feet of water, recalculated to the temperature, 60 degrees F, will be 49 divided by 0.775, or approximately 66 B. T. U. Subtracting this value from the gross heating value, 636.6 B. T. U. per cubic foot, we have a net heating value of 570 B. T. U. per cubic foot approximately.

Use of Specific Heats

It is, therefore, evident that inasmuch as the latent heat in the water vapor does not become available until the temperature of the same is cooled below the boiling point, which does not take place in this case, we must use the net heating value to determine the flame temperature of the gases of combustion. We know from our calculations in previous articles that the products of combustion are 0.545 cubic foot of carbon dioxide, 1.355 cubic feet of water vapor and 4.47 cubic feet of nitrogen, on the assumption that complete combustion of the gas ensues. These are the proportions of combustion gases that are produced in the burning of one cubic foot of the manufactured gas. These products are all figured to 60 degrees F and 30 inches of mercury. To heat these gases we have available 570 B. T. U. The next question is what temperature is attained.

This temperature will depend solely on the specific heat of the aforementioned gases. It has also been pointed out that the specific heat of a gas depends on the temperature; therefore the temperature correction formulae for specific heat must be employed. Furthermore we know that temperature multiplied by the specific heat and by the quantity of the gas will be equal to the heat contained in the gas. All these figures are on the cubic foot basis, that is, the heat per cubic foot of gas. The specific heat formulae are as follows:

For carbon dioxide—

Mean specific heat$=0.023+0.000008\ t$ B. T. U.

For water vapor—

Mean specific heat$=0.021+0.000005\ t$ B. T. U.

For nitrogen—

Mean specific heat$=0.0189+0.0000009\ t$ B. T. U.

In each case it is evident that t is the unknown temperature, the flame temperature, which we are trying to find. Now then, the heat in each gaseous constituent of the gases of combustion is given by the following equations:

Heat in carbon dioxide$=(0.023+0.000008t)\times t\times 0.545$

Heat in water vapor $=(0.021+0.000005t)\times t\times 1.355$

Heat in nitrogen $=(0.0189+0.0000009t)\times t\times 4.49$

Since all of the sensible heat developed in the combustion of the gas goes to raise the temperature of the entire mass of combustion gases, it is evident that all that is necessary to complete our equation is to add together the three above equations, simplifying at the same time by carrying out the indicated multiplications.

First we will obtain the following equations:

Heat in carbon dioxide$=0.12535t+0.00000436\ t^2$

Heat in water vapor $=0.02835t+0.00000675\ t^2$

Heat in nitrogen $=0.08438t+0.00000402\ t^2$

which can be added together to give the following equation:

Total sensible heat in gases$=0.125268t+0.00001513\ t^2$, which is equal to 570 B. T. U.

Solution of Equation

Inasmuch as we are using specific heat values calculated from 32 degrees F and volumes figured at the standard temperature of 60 degrees F, it is necessary to apply the correction factor 0.946 to the above equation. Thus we have:

$$570=0.946\ (0.25268t+0.00001513\ t^2).$$

The solution of this equation will give the value of the flame temperature t. The solution of this equation involves first dividing both sides by 0.946 and then bringing all of the terms of the equation on the right side. Thus we have:

$$0.00001513t^2+0.125268t-603.0=0.$$

The solution of the equation can then be accomplished by using the general formula $t=\frac{-b\sqrt{b^2-4ac}}{2a}$, where a is 0.00001513, b is 0.125268 and c is 603. The value of t is then determined as 3410 degrees F, which is the flame temperature of the products of combustion.

The Use of Preheated Air

In many heating operations, the flue gases are made to pass through economizers to heat up the air that is subsequently used for the combustion of the gas, or else the air is heated by coming in contact with other hot bodies. The use of preheated air involves a change in the calculation of the flame temperature of the combustion gases. The effect of using preheated air is just as if there were that much more heat evolved in the combustion of the fuel in the form of sensible heat which is known to have the effect of raising the temperature of the flue gas.

Example of Calculation

For example, suppose the aforementioned gas was burned with air preheated to 1000 degrees F. It was shown in a former article that the sample gas, whose analysis was repeated above, requires 5.64 cubic feet of air for complete combustion. This quantity of air is added at a temperature of 1000 degrees F; hence it is easy to calculate the quantity of heat Q, that is contained in the air. This is given by the following formula:

$Q=(0.0189+0.0000009t)t \times$ volume.
$Q=[0.0189+(0.0000009t)\ (1000-32)]\ (1000-32)\times 5.64.$
$Q=107.9$ B. T. U.

This represents the heat in 5.64 cubic feet of air at 32 degrees F. To convert to the basis of 60 degrees F, the above value must be multiplied by 0.946, which gives a value of 102 B. T. U.

This value is then added to 603 in the above equations used to determine the value of t, giving a total of 705 B. T. U. per cubic foot, and by solving the same in the same manner as described above, we obtain a flame temperature of 3840 degrees F.

When the gas itself it preheated in addition to the air, the sensible heat in the same must be calculated in the same manner and added to the equation as described above. The calculation of the flame temperature is the same as what has been followed through in detail above.

Importance of Flame Temperature

It is evident that the flame temperature is the maximum temperature that can be obtained by the combustion of the fuel. It is also clear that this maximum temperature cannot be attained in practice, due to slow combustion, incompleteness of combustion, radiation of the flame during combustion, the use of more or less air than is necessary for combustion, and other causes. In the combustion of fuel, the essential point is to get the heat in the fuel to do its work. Heat is transferred from one body to another in three ways, conduction, radiation and convection.

When two bodies touch each other, heat is transferred by conduction. In this case the quantity of heat conducted is dependent directly on the difference in temperature between the products of combustion and the body heated. In the case of radiation, the heat is transmitted through the agency of air. The amount of heat transmitted is proportional to the difference of the fourth powers of the absolute temperatures of the radiating gases and of the material heated.

It is thus a very important consideration that the temperature of the heating medium be as high as possible in order that the heat in the same be transmitted as completely as possible from the hotter to the colder body. Thus in a furnace, as soon as the products of combustion are cooled down below the temperature of the heated body, all transference of heat ceases.

It is evident that the end temperature, that is, the temperature at which the flue gases must leave the furnace in order to heat the material up to the point desired, must be the same, no matter what the character of the fuel is. To produce a temperature of 1000 degrees F in the substance under treatment, it is understandable that the flue gases must leave the heating furnace with a temperature of at least 1000 degrees F. In actuality their temperature is apt to be considerably higher. Thus, in using different fuels for this particular purpose, the one which gives the higher flame temperature at the start of the heating process will possess certain advantages over the rest.

Comparison of Fuels on Flame Temperature Basis

Suppose it is necessary to heat a substance to 2500 degrees F. If the flame temperature of one fuel, that can be used for this purpose, is 2800 degrees F, then the heat that is given up by the hot gases to the aforementioned substance is that contained in the products of combustion as they cool down from 2800 to 2500 degrees F, or through a range of 300 degrees F. If we have another fuel, whose flame temperature is 3500 degrees F, then in this case the heat is given up to the heated body during a temperature differential of 1000 degrees F. It is of course evident that the gas with the higher flame temperature will yield more of its heat to the heated body than the other. The amount of heat that is transferred will of course depend on the mean specified heat of the gases and the temperature that is attained in the heated body will depend likewise on the specific heat of that body.

(Continued on page 556)

How Smaller Ideas In Merchandising and Advertising Make for Success

A discussion of essential principles by an expert

W. E. Richardson

Advertising Department American Stove Co.

The following paper was read at the first meeting of the year 1923-1924 of the Gas Sales Association of New England, Friday evening, November 9, 1923. This meeting was devoted entirely to advertising.

"WE are thrilled every once in a while with stupendous facts and figures about large advertising campaigns. We are told of the big list of well-known magazines, double page spreads in colors, the pages in a hundred or more big city's newspapers—in fact, the sky seems to be the limit. But somehow the smaller, or real, essentials that make for a successful campaign are very often lost sight of in the mad rush to put over 'the biggest one yet.'

Supporting Ideas Necessary

"Now for a slight digression. The other week I drove home to Cleveland from New York. I thought that inasmuch as I had never seen the famous Ashokan Dam, I would travel that way. As I drove along the shore of the reservoir, I could not help but notice how little water there was in it. I stayed quite a while at the same, which is a gigantic work of engineering. I marvelled that human ingenuity was able to produce such a wonder. When I was told that it cost over thirty millions of dollars, it was easy to believe. I lingered at this point. All I could see was a desert waste. Through the middle trickled a stream of water so small that it would take, I figured, years to fill the reservoir again. I knew that it had been exceedingly dry in the East the last two years, but I never realized how serious it was till then. It looked all the more forlorn because it was a dark day; in fact, it had rained all the morning. Then we drove up the road that parallels one of the main rivers that supply the reservoir. It seemed to me that it was carrying a little flood water.

"As we continued on our way I noticed that the smaller creeks, which empty into the river, were all filling with water. I followed these creeks with my eye up the sides of the mountains, and observed that the little streams that fed the creeks were also flooding. As the day wore on, and the rain increased, the brooks and creeks that led into the river became actual torrents. Somehow or other, I could not erase this vivid picture from my mind.

"Then suddenly the reason dawned upon me. Nature herself had shown me in one great entirety the very plan that is necessary to make advertising successful. Down below was a gigantic dam that made a mighty reservoir, but absolutely worthless unless constantly fed by tiny creeks and brooks behind it. Thus it is with advertising—quite complete perhaps from the standpoint of size, but useless unless there flows back of it the streams and brooks of the smaller, or I might say the supporting ideas, that make the big dominant idea of any value.

Co-operation

"Now I could tell you the names of several notable advertising failures during the last ten or fifteen years, all due to the fact that the smaller things—the items usually regarded as unimportant—were either lost sight of or not carefully worked out and put into effect.

Watch the Small Items

"Now let us see how the smaller things in advertising go to the very heart of the big idea. I know of a simple case in point. I am told that in Springfield, Mass., there are two adjacent shoe-shining stands. The stands are practically identical in appearance, and the number of people passing each is about the same. On a Saturday afternoon it was observed that one stand was filled, the other was looking for business. The bootblack whose stand was only partially filled advertised this way to attract the crowd: 'Get a shine—10c.' The other, whose stand was filled, advertised: 'Get your Sunday Shine—10c.' He has added a word and changed another. Thus do minute

things influence materially the progress of businesses, both large and small.

The How and Why

"Now I think that what might interest us most are facts as to the 'how' and the 'why' of all the smaller things in advertising, and I believe that if we will confine ourselves to those that sell gas ranges we will not only feel 'right at home,' but will also be able to get some real value from what follows. We must divide them into two divisions: First, activities caculated to induce prospects to come inside the dealer's store. Second, those that get prospects to take merchandise outside after they are in. Going back to the first division, the main ones are as follows:

"A—(a) Newspaper Advertising.
(b) Direct Mail
(c) Window Displays.

B—In the second division we have—
(a) Demonstrations.
(b) Sales Plans.
(c) Floor Display.
(d) Sales Meetings for interchange of ideas.
(e) Signs.

National Advertising

"National advertising is primarily educational. It aims to sell all it can—but its very first function is to create interest on the part of possible buyers with the merits of a product. It is possible to go into detailed descriptions in the magazines, for they are read leisurely. They create a background for newpsaper advertising such as nothing else can.

"Practically every family reads some magazine or other, and in many cases two or three. Good advertisements in a magazine usually create a profound impression, for it is now universally accepted that the leading national magazines carry no copy for any product that does not live up to the claims made for it in the advertisement. When a magazine advertisement is read, then an advertisement on that same product in a newspaper, say, a day or week later, the value of both is increased many times.

Newspaper Advertising

"Thus it follows that local newspaper advertising by the gas companies is most important if full value is to be gained from a national advertising campaign. Remember, newspaper advertising reaches more prospects for a given amount of money than any other form of printed matter. An advertisement of a size two columns wide by twenty inches deep in the average newspaper of average circulation for one insertion costs but .0016 cents per reader. This comparatively low cost is universal, and explains why last year the newspapers of America carried advertising to the value of $600,000,000. Most advertisers of the first rank usually furnish a complete newspaper advertising service to their customers for their local use. And frequently more time is spent in the preparation of newspaper copy than in the writing of magazine advertisements.

Manufacturer Helps Dealer

"One big manufacturing company spends several thousands of dollars yearly for the services of three press-clipping bureaus in order to procure special advertisements written by their agents. This is done in order that their advertising experts may study these original advertisements and thus be able to make their service for agents as effective as possible. Most national advertisers when planning an advertisement for one of the big publications also plan an advertisement for newspapers that closely resembles the magazine advertisement in matters of design, illustration and copy.

Appeal of Copy

"All manufacturers would like to see their distributors take the time to 'get up' original newspaper advertisements that would even more closely meet local conditions. Each town has its own personality. Each agent has his own problems. All of which you well know. It isn't difficult to learn how to create the kind of advertisements that reflect the character of your establishment and the merchandise you sell. And after you once learn the simple art, and see the results that come from your efforts, you will feel more than repaid. Please don't feel that it's hard to write and design newspaper advertisements, for it really isn't. Many merchants make the mistake of trying to please themselves or their force of employees in selecting the ideas or manner of presenting them in newspaper advertisements. This is a mistake because the reader wants to learn of your merchandise from his own interested angle.

"So write your advertisements to appeal to the largest class of buyers; the rest will follow naturally. Put yourself in the buyer's place and write as you would talk to the prospect if he were in your store. A good way to get the perspective and the proper view-point is to take the newspaper advertisements of the department stores and other successful local advertisers in your town, and study their appeal. These advertisers know from their own experience what is best to say, and how best to say it. Also, they must have the right angle because it is a well-known fact that department store advertising brings results, and gets people into the store to buy.

Illustrated Advertisements Are Best

"In making your own advertisements, first select the particular products you wish to make a drive on. Describe them simply and in such a way that the reader will feel that here is something he needs or wants, that the quality of the product is good, and the price reasonable. Use illustrations wherever possible and try to get good ones. Most manufacturers are glad to supply electrotypes showing their merchandise. The newspapers will take care of the set-up. If in your judgment the set-up is not good, make changes and have them show you a revised advertisement. For the advertising that you give the newspapers they should be glad to help create attractive advertisements and relieve you of many details. Many papers nowadays have departments for just such work. Use as much white space in advertisements as possible, for this makes them stand out.

But don't overdo it—space costs money. On special occasions when you may want to use a full-page advertisement, and lack a real basic idea, try this—select an electrotype of a good looking advertisement furnished by the manufacturer, place it in a prominent place in the page layout and then write your own idea around it. Let the newspaper take the electro and copy and build an attractive full-page smash that will make the reader take notice of your advertisement above all others, and remember it so vividly that they will want to come to your store to buy the merchandise you are offering.

"Every national advertiser is, or should be, deeply interested in the local advertising efforts of his dealers, sufficiently interested to co-operate in every reasonable way, especially when the dealer is really attempting to do something worth while. A continuous campaign in local newspapers should certainly be considered worth while, and the manufacturers should be, and invariably are, willing to assist in the planning of advertisements for a campaign of this kind, or to have the experts in his employ pass upon such material that may be created by the dealer himself.

Substitutes for Newspaper Advertising

"Now, of course, there are many towns where there are no daily papers. In such instances we must find good substitutes for newspaper advertising in order that people may learn of your merchandise. Three good substitutes are: letters and circulars mailed or distributed to the homes, personal telephone calls and personal visits to the home. Any one of the three should develop a good prospect list. For mailing, most manufacturers furnish stuffers and folders to mail with other items. These can be used to advantage to get customers into your store.

"These sales offers presented to your community by means of letters or telephone calls or personal visits can be based on most any article of merchandise. Two items, however, stand out as being very good, namely (1) some brand-new article of interest to the housewife, that is, something that is calculated to make her home more beautiful or her housework easier, or (2) something that you are able to offer at a considerable saving over the regular price. In case you don't want to do the telephoning yourself, have a girl at a small salary do it. No doubt the sales results from this activity will make her expense seem quite small in comparison. The telephone method gives an intimate touch to dealings with customers and prospects. Many department stores do this regularly every day. It is an exception when a person resents being telephoned about merchandise that sounds attractive as to both quality and price. Most people appreciate knowing about items of this kind.

Advertise Consistently

"Do remember this, however, that no matter how many people in your town have been favorably impressed with the advertisements they have read in the magazines, unless you let them know that you have the exact product they have read about, and keep on letting them know by means of newspaper advertisements or other kinds of advertising, day in and day out, you might as well not have the product in stock.

Importance of Window Display

"Marshall Field & Co. of Chicago, the largest and one of the most famous department stores in the world, pays their head window trimmer $20,000 a year. They have a department of many trained people to assist him. Averaging the various estimated figures I have heard, I would say that it costs Marshall Field's something like $100,000 per year for the maintenance of their window displays. So it is easy to see the tremendous valuation they set upon the sales values of their windows. A window display is valuable in direct proportion to the number of people that pass it. It is like a newspaper, the pedestrians passing along on the sidewalk form its circulation and they read your windows as they would an advertisement. Windows, I might say, are next in importance as a means to get the people into a store—so don't spare any pains in making your windows as attractive as possible, so that they extend a silent invitation to come in. Be sure to use cards or signs that tell something. People often look in a window, admire it, without ever thinking of coming in, unless your windows suggest it.

"We tried this out several years ago in Toronto with a window display of kitchen cabinets. We had a nicely arranged display, but nothing else. Then a number of signs were put in the window, inviting the people to come in the store, and after that three times as many passers-by stopped, and twice as many people came in to seek further data. The mere addition of the signs 'did the trick.'

Important to Have a Good Prospect List

"But, most important of all, build up and maintain a good mailing list of prospects. There are almost as many ways to do this as there are kinds of prospects. All sales or demonstrations are staged to bring into the store a large number of people, methods should be devised to obtain the names and addresses of as many as possible of those who attend. People are apt to postpone the purchase of articles, even of those for which they are badly in need. Especially is this true of articles such as gas ranges. Few gas ranges go to pieces all at once like the much mentioned 'one horse shay.' Most any woman can find a good excuse for clinging to her old gas range, even though it be literally on 'its last legs.' Of course, her true excuse for not discarding the old range and buying a new one is, invariably, that she can think of many other things she wants more (even though she needs them less) such as a dress, coat, victrola or something else to beautify her person or home.

"In practically every locality where gas has been in use for a considerable time you will find hundreds and even thousands of gas ranges that should have

been discarded months and years before. It is the owners of such ranges whose names and addresses you should attempt to get for a mailing list, and you should not consider them 'dead' prospects until these people have purchased a new range, regardless of the length of time or the number of times you may consult them in person, by mail or by telephone. By consistent effort you will ultimately convince them that what is needed is a gas range more than anything else. When you have done this you have made the woman want it and people are more apt to buy things they want than things they need.

Demonstrations

"Now to describe the activities that are designed to get prospects to take merchandise outside a store after they are in. Let us take the first activity, that of demonstrations. As gas men, you are most interested, of course, in gas appliance demonstrations. The gas range demonstrations that we have found most productive of sales are, in order of their importance: Oven canning, whole meal cooking and the more difficult articles to bake, such as angel food, angel cake, biscuits, etc.

"The reason I place oven canning demonstration first is because the results of your demonstratoin can be retained indefinitely. In fact, the longer you keep a stock of canned goods properly labelled to show the date when it was canned, the more interest such a display creates. If next canning season you give a demonstration of oven canning, and are able at the same time to display the results of your 1923 effort, your audience will be doubly impressed; you can see this for yourself.

"Whole meal oven cooking is probably the most dramatic of all the many methods used to demonstrate the advantages of a gas range with heat control. If you are putting on a whole meal demonstration always select a menu that has a wide appetite appeal, not unusual or fussy dishes.

"When staging demonstrations always attempt to get as big a crowd as you can conveniently and efficiently handle. There's a point in psychology in this. Most people consider a packed house as proof of a good 'show.' Also, you can always sway the opinions and emotions of a crowd easier than you can those of a small group or of a few individuals. The value of a demonstration is in direct ratio to the attendance, the bigger results in sales. In order to get large attendance at demonstration it is essential that you advertise the event, by mail, by handbills, by telephone, by newspaper advertising. This should be done at least two weeks before the event, as most women plan their time ahead.

"No matter how you announce the demonstration, be sure to state the exact day, hour and place of the event and suggest that the one invited bring 'a friend with her.' Tell them the name of the appliance you intend to demonstrate, what you will use in the demonstration, the name of the demonstrator, and other information that may lend interest to the invitation.

Floor Display

"Without proper floor display you are missing a great opportunity to interest people in your merchandise. People are constantly coming into your establishment to buy certain articles or to pay for same. Suppose a person drops in to buy a small item. Probably that's all she has on her 'buying mind,' so far as your place is concerned. If you don't display gas ranges where she can see them, she'll never think of them, of course. So, why not see to it that your best-looking ranges are in such a prominent position on your floor that anyone who comes in cannot help but see them? Have your sales force so trained that whenever a visitor stops to look at an attractive model there is a salesman ready to step up and begin interesting her in a new gas range. Of course, it is not always possible to have a sales force of sufficient size that a salesman is always available for every shopper. The American Stove Company discovered this fact some time ago and learned at the same time that for the lack of available salesmen many sales were lost.

Self-Selling Label

"To overcome in part this difficulty a label the size of a letter-head is now pasted on the splash-back of every gas range of a certain type, explaining briefly the many advantages of the appliance. The last line on this 'self-selling' label carries to the shopper the invitation, 'ask the salesman.' That's going a point beyond anything yet undertaken by a manufacturer to hold a customer's attention for the agent. It is also an attempt to relieve the seller of a part of the necessary work of explaining the appliance. Don't expect the stoves to work alone. They need aid just like in war the infantry needs the support of the artillery. So make it a point to have attractive placards placed in prominent positions on or near the stove display. At least this will give the visitor some information about them even if she doesn't stop to examine the stoves, and thus you have flashed your message to her in another way—aside from the newspaper, magazine or direct mail.

Sales Meetings

"The last point is sales meetings. If your sales force is large enough, it is a mighty good idea to have 'get together' meetings at least once a week. Let your people meet and talk about their mutual sales problems, have each one state his stumbling blocks and ask for suggestions to remedy these perplexities. Then ask for new suggestions on selling. Seek new ideas as to how to advertise. Some weeks before your various seasonal campaigns, like Christmas or spring house cleaning, call your people together and ask for suggestions as to how to plan a campaign to get people into your store. If, after you have held these meetings for some time, you find that ideas are lagging, spur your employees by means

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The Life of a Meter Reader*

A description of a meter reader's day's work

George W. Sherman

A METER READER would define himself as a "student of life." While such a statement is, perhaps, a little too broad and indefinite, it is not to be laughed at. I believe I may say that there is no one who comes in contact with life in its varied forms, with people in their more personal relations with each other, than the meter reader. He is a monthly guest at the homes of rich and poor alike; he knows no social discrimination. He greets the Mrs. Smith who inhabits a few filthy rooms in an East Side tenement house with as much good will and enthusiasm as he does her more fortunate sister, Mrs. S-m-y-t-h-e, who lives in the fashionable residential section. Why should he do otherwise? Both are his customers and both constitute a portion of humanity.

In his hand he carries a book of meter cards and a pencil, and from his hip pocket there projects something which might have been a bottle of Old Scotch Rye had it not been a flashlight. These are the implements of his profession, and they become as securely identified with him as a hoe or a rake with a farmer.

The Meter Reader a "Fiftieth Cousin" to Everybody

A meter reader is kind of a "fiftieth cousin" to everyone. Some admit even a closer relationship and permit him to enter the house without knocking, as do members of the immediate family. Poets starve to death writing their verses, but meter readers live on the fat of the land. The seven years of leanness of Biblical times will remain a myth to them as long as mothers bake cookies and wives fry doughnuts. Thanks that a boy has pockets which will serve as temporary storehouses for these gifts which might otherwise have appeared on the festive board. The best fruit of every season is at his disposal, and not infrequently, especially if the weather is hot, people open their cellar doors and part with a bottle of their cherished drinks for the meter reader. I recall such an instance not very long ago.

Location of the Meter, the Meter Reader's Bugaboo

It will be a meter reader's paradise when all meters are located on the back porches of houses. Unfortunately no such Utopia for meter readers exists. It is true, however, that most public service companies are making rapid strides in endeavoring to standardize the location of meters. If such an ideal state is ever reached or only approximately reached, it will mean a great conservation in time, to say nothing of the increased convenience to both customer and reader. On the other hand, it will tend to diminish that personal relation between the customer and reader which entering a house develops. Under such a condition a reader will not find it necessary to rap at the door, and consequently he will gradually drift away from that intimate acquaintance with the members of the household. Thus a mere change in the location of a meter to the back porch will result in an entirely new set of modified experiences for the reader.

No Definite Location for Meter

There is no definite location for a meter, as has been already hinted. On the contrary, they are found in the most diverse and extraordinary places. Some are located in attics, others in basements; some in bathrooms, others in kitchens; some in pantries, others on back porches. In short, any room in the house is a popular and potential location for a meter. Not infrequently a gas meter raises its frightened countenance above a can of crackers which has been placed in front of it in the pantry, and exclaims, half frantically, "Don't forget me, boy; I'm in here!" In the newer business buildings and apartment houses meters are found in meter rooms at the same location on each floor. It is always a pleasure to read in a meter room because all one has to do is to sit down and copy the dial readings onto their appropriate meter cards.

In view of this diversity of location, customers have often wondered at the "marvelous memories" of their meter boys. While a meter reader does possess an abnormal retaining faculty, it is by no means "marvelous." His memory is continually taxed, and his routine work month after month develops it to what seems almost the point of perfection. However, if he should forget the location of a certain party's meter he need only refer to his meter card and re-inform himself.

The Meter Reader's Shorthand

All data of this nature is written in an abbreviated form which might be called meter readers' shorthand

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*Reprinted from the Stone & Webster Journal.

in a space on the card provided especially for this purpose. The phraseology is brief and simple, yet complete enough to enable the reader to locate a meter quickly and correctly. For example, the letters "B. P." inform him that the meter is located on the back porch; "U. S. H." translates itself into upstairs hall; "U. H. R. S." into under the house on the right side; "R. O. K." into room off kitchen, etc. Besides these general directions, there are often more specific ones which concern preferences of the customer. Although the latter are of minor importance, and in some cases seem to degenerate into "mere hobbies" of the customer, the meter reader endeavors to carry them out.

If the lady of the house has requested him to come to the back door or front door, whichever inconveniences her least, he jots down the letters "B. D." or "F. D." And the lady is both pleased and astounded at his indefatigability in carrying out this little favor. Perhaps she will remark after a few months to a trusted neighbor, "My, but that meter boy must have a wonderful memory. I told him to come to the back door and he never forgets." If she could look at the meter card her estimate of the meter boy's memory would fall 30 degrees.

Meter Cards Sometimes Contain Real Secrets

Meter cards contain very interesting information. Often the most personal secrets are disclosed on them. I recall turning over a card a few days ago which read, "You will find the key under a bottle of milk in the refrigerator." Another one advised, "Call the dog 'Isadore,' and he will not bite!" Information of the latter type is of the greatest value to the self-preservation of the meter reader. Sometimes readers are inspired to write little comments on blank portions of the meter card. I have never been guilty of such a gross misdemeanor, but some of my predecessors have. I remember climbing four flights of stairs to read a meter which was located on a pole in the attic of a once elaborate residential house. After securing the reading, I happened to glance at such a composition, written in affectionate irony on a corner of the card. At any rate, it provoked a laugh from me. "Take the elevator. Oh, boy, don't you feel exalted way up here! Console yourself, perhaps it's as near heaven as you will ever get."

The Organization of a Meter Reading Department

I presume that the organization of the meter reading department of no two public service corporations is exactly alike. The Puget Sound Power and Light Company, which is located at Bellingham, Washington, serves a community of some 40,000 inhabitants, and has in its employ three meter readers who read the entire city within a period of approximately 25 or 26 days. The city is divided into street districts corresponding to the letters in the alphabet, and as far as possible one route is read each day. The few remaining days at the end of the month are devoted to a revision of the routes, such as rewriting meter cards and in securing "pick-up readings" on meters which were skipped or which were unable to be read on the scheduled route day during the month.

Meter Reading Fascinating Work

When a meter reader leaves the office in the morning his experiences for the day have begun. At this point I would have my listener understand that the meter-reading profession (may I speak so elevatingly of such humble work?) is not routine toil. Those who have such an erroneous belief have never read meters. On the contrary, it is as interesting and fascinating work as anything could possibly be. It is an education of which there is none more broad or far reaching in its effects. It means meeting people, but in addition to this, it offers a splendid opportunity for studying people in their true light. The Mrs. Jones that the dressmaker fits or the grocer greets behind his store counter is not the same Mrs. Jones who admits the meter boy into her kitchen to read the meter. By such a statement I mean simply that all life, apart from life as it exists in the home, is affected, unnatural and consequently abnormal. To know people, not as they think they are or dream to be, but as they actually are; that is the meter reader's privilege.

Topics of Conversation for the Meter Reader

A meter reader must remember that the weather is the safest topic for conversation. If a customer relates some choice bit of gossip which has not yet been aired in the newspapers, he must change the subject with transitional delicacy to last night's beautiful sunset or some such less harmful theme. Before election time he must be prepared to hear the merits and demerits of each candidate discussed, and every plank in the opposing party's platform taken to pieces and rebuilt until the new edifice smacks of some originality. Out of a desire to be agreeable he answers them all affirmatively and then wonders when he will possess any political preferences of his own. Others of his customers detain him on the doorstep to predict the millennium and relate descriptions of heaven to him in their moments of spiritual ecstasy with amazing accuracy.

Odd Characters Met

The characters whom he meets in his daily traveling would fill a story book full. Among the most interesting of my acquaintance was a jolly colored woman who had five or six little dogs which bore names of every state that had previously existed in the Confederacy. I scarcely had to rap at her house twice before the door of her narrow hall would swing open and reveal her in the midst of her canine

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New Warehouse for Pacific Gas and Electric Company

THE Pacific Gas and Electric Company recently completed a two-story reinforced concrete building two hundred feet long, taking the entire block on one street and two hundred feet deep in the city of Oakland, California. The walls are practically all glass, giving good light to every department and better working conditions for the many men employed in the various departments housed there.

Practically half of the lower and a portion of the second floor is used by the warehouse department. With its raised floors and receiving and discharging doors on both the south and rear sides, material can be much more quickly and easily handled than formerly.

The office on the southwest corner is light and sunny and is far more pleasant for its workers than its predecessor. The company garage occupies the northern half of the lower floor.

In the rear of the building an auto driveway extends through the length of the building, covered its entire length with a glass skylight. The parking or auto-storing area still further back, where there is room for fifty cars and trucks, is constructed in similar manner.

Facing on this driveway in the center of the building is the gas meter department, with its office and distributing room for meters.

In the center of the lower floor are the lavatories, washroom and lockers, clean and sanitary, accessible to all departments.

The gas meter repair shop is about 100 by 122 feet in area. Here all the gas meters for the East Bay Division are repaired and tested.

The elevator is in the center of the building and material for the upper floor of the warehouse department and all meters of both gas and electric meter departments are handled by it.

Treatment of Spent Oxide

ACCORDING to "Das Gas und Wasserfach," the Rhenania Co., of Mannheim, have patented a new process for recovering from spent oxide cyanogen compounds and high percentage sulphur, leaving the oxide fit for further use. It consists in treating the spent oxide with a hot solution of sulphides or polysulphides of alkaline earths, and subsequently decomposing with sulphurous acid the polysulphide liquor formed. The result is a mixture of sulphur and sulphites of alkaline earths, while the cyanogen compounds remain in solution in the form of their earth-alkali salts, and can be worked up by known methods. The separation of the sulphur from the sulphite follows by treatment with acid, and thus sulphurous acid is formed, which is used again in the process. The lixiviated oxide is regenerated as usual, and is then available for further purification work. The following example is given to illustrate the working of the new process: 2,000 kilos (about 2 tons) of spent oxide with about 50 per cent of sulphur content are mixed into 6,000 litres of barium sulphide solution, which should contain more than 300 grammes BaS to the litre, and treated with heat. The lixiviated oxide is then separated by filtration from the barium polysulphide liquor which has formed, and the latter is treated with strong sulphurous acid. During this process, besides the sulphur extracted from the oxide, a considerable quantity results from the action of the sulphurous acid on the barium sulphide. Also the total barium separates out in the form of barium sulphite, while the cyanogen compounds remain in solution, and can be filtered off. The mixture of sulphur and barium sulphite is now stirred with hydrochloric acid. In this way sulphurous acid and barium chloride are formed, while the sulphur remains undissolved, and by filtration and washing can be prepared for whatever purpose required. The barium chloride is worked up to a solid salt, and the ferrocyanide salts are taken out of the solution in the usual way, and worked up to potassium ferrocyanide. The sulphurous acid is used again in the process.

As The Journal Views It

UNFAIR ATTACKS

Day after day for several weeks the yellowest of New York's yellow journals has featured a cartoon showing the gas interests in a most unfavorable manner. The paper, in its fight on certain politicians and political organizations, has very unjustly and without cause put, not only the gas interests, but other public utilities, to ridicule.

The gas company is pictured as a fat, greedy, money-grabbing human pest, loudly dressed, with a ten-carat diamond in his necktie. His every effort, at the present time, is being devoted to the buying of judges, so the caption under the cartoon states.

During the recent convention of the American Gas Association in Atlantic City, "Public Relations" was probably the most talked of subject. The guiding heads of every gas company, both large and small, throughout the entire company, in convention and out, stressed the point that no effort should be spared, no stone left unturned, to bring about a better feeling between the gas user and the gas maker and seller. For years it has been the policy of the gas companies and other public utilities to insist that the public be given the most courteous treatment at the hands of their employees. Complaints have been promptly handled and faults in service remedied as quickly as possible. Everything possible has been done to show the public that the companies serving them stood ready and willing at all times to do what was fair and right.

It is unfortunate that a metropolitan newspaper, one with a national circulation, should, in a few weeks, by unfair, unjust cartoons and articles, tear down and destroy the work of years.

The situation has its humorous side also. The owner of the paper which is constantly fighting wealth is a poor, needy individual with only twenty-five millions of dollars between himself and starvation. He owns six of the largest newspapers in the United States, several of the largest magazines, two tremendous moving picture companies and valuable real estate scattered from New York to California. His father was a very rich man and after his death his son, the present "friend of the horny-handed son of toil," used the paltry sum of three-quarters of a million dollars of his mother's money in getting a start in life.

The joke of the whole matter is that a man worth twenty-five millions has the nerve to cartoon any gas company as a bloated bond holder.

It seems to be the hobby of yellow newspapers and cheap politicians to constantly attack the public utilities. It is the duty of the utilities, therefore, to fight harder, to never let up for one second, their efforts to make the public their friends. Kindness, courtesy and good will shown to a public three hundred and sixty-five days out of the year will finally win, and then such unreasonable attacks will cease, or, at least, the intelligent reading public will not be influenced by them.

MANHOLE EXPLOSIONS CAUSED BY ELECTRICITY

Manhole explosions in the city street is a subject frequently seized upon by the public press whereon to hang a story, with more or less lurid detail. If the explosion occurs in an area of heavy traffic and personal or property damage results, it has still greater value as "news."

Following such an explosion, the usual procedure is that of an official investigation, which ofttimes results in a stereotyped verdict to the effect that the explosion was caused by escaping gas from a leaky main, finding its way into the manhole and becoming ignited. It may not be stated what did the igniting, or a discarded cigarette or burning match may be requisitioned and introduced into the report for this purpose.

If the explosion is attended by extraordinary results, the local gas company may be made the subject of attack by those who lay in wait for such a chance, or at best it is made to feel decidedly uncomfortable about the matter.

The discovery, made by the City of Oldham (England), will be of interest to those who may have had experiences along the above lines. Whenever a manhole explosion occurred in that city, and the instances were numerous, it was the practice of the city officials to place the blame upon assumed leaks in the local gas company's mains, with an accompanying assessment for the damages incurred. The gas company had no defense and had to pay. During recent months, however, a series of underground explosions took place which warranted careful investigation by the corporation electrical engineer. The result of this investigation proved that these supposedly gas explosions were due entirely to electrical faults.

The C. E. E., in his report, stated that the underground electric wires were insulated with vulcanized bitumen and laid in wooden conduits. When a fault occurred, bitumen gas was generated from the insulation and upon ignition from the short circuit an explosion resulted. The trouble is said to have been due principally to the excessive load on the electrical lines.

Here is one instance where an intelligent and conscientious public official got down to actual facts and disproved an erroneous popular theory that manhole explosions were due to escaping gas from gas company mains.

THE LIFE OF A METER READER

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pets, waving her arms frantically and exclaiming, in high pitched tones:

"D'wan Dixie, d'wan Tennessee and Georgia! Quits youse barkin' dere, Mis' Virginie; youse allers hollers de loudest." Everyone was talking about the total eclipse of the moon of the previous evening, and so she lit into it, too. She informed me that she stayed awake to see it because there might not be another in the course of her lifetime. Oh, yes, life is transient enough, we say, but none realize it as much as the old.

There is nothing mystic about meter reading. If there were, meter readers would spend their summer vacations on the stage. The next time your meter boy calls, hand him your yardstick or broom handle and tell him you would like to learn to read your own meter. He always has a few spare moments and will feel flattered to be asked for information concerning the intricacies of his profession.

A meter reader soon learns that the majority of housewives observe Monday as wash-day, and that there are a great many bad dogs which ought to be muzzled or shot or something. Besides this, he enjoys immortal youth. Persons in other professions grow old and grouchy, but he is always the meter boy to his customers, whether he is 15 or 30, or wears short trousers or extensions.

FUEL OF FUTURE

(Continued from page 547)

Different Values of a B. T. U.

A British Thermal Unit has been defined to be a unit of heat, measuring the quantity of heat that a body may contain in terms of the amount of heat required to heat one pound of water one degree F at 60 degrees F. Now a B. T. U. at any temperature is always the same amount of heat, but its capacity for doing work is different. This does not mean that it can do more work at one temperature than at another, but it can be a different kind of work. For example, a B. T. U. at a temperature of 200 degrees F still has the same capacity as one at a temperature of 3000 degrees F. But it is impossible to vaporize water with the aid of the low temperature B. T. U., but on the other hand it is possible to use the high temperature B. T. U. for this purpose. In fact, this B. T. U. can generate steam until the temperature of the heating medium is reduced to 212 degrees F. It is thus even more evident that the flame temperature, secured at the start of the heating process, is an essential factor in the same, and that the greater the temperature differential between the heating medium and the heated substance, the greater and more effective will be the transmission of heat from one to the other.

Rate of Heating and Furnace Capacity

The flame temperature has also an important bearing on the rate of heating, which is itself closely bound up with the capacity of the furnace and the furnace efficiency. If we are melting brass in a gas-fired furnace, in which the temperature must be kept at 2600 degrees F and we have available two kinds of gas, blue water gas and producer gas, what will be the advantages of using one in preference to the other? The theoretical flame temperature of the blue water gas is known to be 3600 degrees F and that of the producer gas, say 3100 degrees F. It is therefore quite evident that the heating takes place when the producer gas is used during the range from 3100 to 2600 degrees F, or 500 degrees F, while in the case of the blue water gas, the heating occurs during the temperature differential between 3600 and 2600 degrees F, or 1000 degrees F. This is, of course, based on the assumption that the flue gases leave the furnace with that temperature and they must leave with at least that temperaure or otherwise the temperature of the molten brass would be lowered and the melt will freeze. It therefore follows that the blue water gas will do approximately twice as much heating as the producer gas.

But it is not only in the quantity of heat transferred that an advantage is gained by the use of blue water gas; there is also obtained a greater rate of heat transmission. The greater the temperature differential between the heating medium and the body being heated, the more rapid will the velocity of heat transmission be. This, of course, means that

the heating process will be more rapid when the flame temperature of the products of combustion is greater. The brass melting process, for example, will go on much more rapidly with the blue water gas than with the producer gas. This means that the brass will have to remain a shorter time in the furnace, which connotes greater furnace capacity, decreased labor costs and other expenses incurred in the heating process.

Furnace Capacity and Furnace Efficiency

The use of blue water gas will therefore increase the furnace capacity, but it will do more; it will increase the furnace efficiency. The losses of heat due to radiation and conduction are not dependent directly on the flame temperature. That is, the heat losses do not increase in the same proportion as the increased capacity of the furnace. The result is consequently that the furnace efficiency is increased.

This discussion has clearly shown the importance of the flame temperature of a fuel. It also indicates the significance of the heating value of the fuel, for the flame temperature is directly dependent on that factor. It therefore follows that the greater the B. T. U. value of a fuel, the greater will be the flame temperature, the greater the capacity of the furnace and the greater the overall furnace efficiency.

Flame Propagation

There is still another important characteristic of a fuel that must be studied before the fuel can be properly applied to the solution of a heating problem. That is the rate of flame propagation. Dependent on the character of the fuel in the gasified form and the proportion of the same and of air in the combustive mixture, each and every fuel and air mixture will have a different rate of flame propagation. The rate of flame propagation can be defined as the speed wtih which the flame will travel through a column of mixed air and gas in explosive proportions.

The importance of flame propagation has been evident to the gas man in the design of gas burners. It is known that the air and gas are mixed together in the burner and it is possible for the mixture to burn in three ways. First, the gaseous mixture may burn at the very tip of the burner, then it may burn at a certain distance from the tip, the flame being blown away from the tip, or else the combustion can take place back in the burner tube itself, giving rise to what is known as "back firing." The different conditions of burning are due to the rate of flame propagation in the combustive mixture. When the gas burns right at the tip of the burner, the rate of flame propagation through the gas-air mixture is the same as the rate of travel of this mixture through the burner. When the latter velocity is greater than the former, the gaseous mixture will burn away from the tip of the burner, and when it is less the mixture will burn back of the burner within the burner tube.

The importance of this matter is undoubted, but there is still a greater significance to this characteristic of a fuel. The rate of combustion is an important consideration in determining the flame temperature of a burning fuel, other things remaining constant. Thus the more rapidly a fuel will burn the greater the amount of heat will be liberated within a given time and the greater will the temperature of the resulting products of combustion be. It is well known that the maximum flame temperature is obtained when a substance burns with explosive velocity, which explains the great heat and force developed by an explosion. Hence the greater the rate of flame propagation the greater the flame temperature and the greater the furnace capacity and furnace efficiency.

Flame Propagation and Ignition Temperature

It has been explained that the ignition temperature of a substance is that temperature to which it must be heated in order to burn, that is, to combine rapidly with oxygen. If the heat generated during the burning is sufficient to keep the temperature at that point despite the radiation and other heat losses, the fuel keeps on burning of its own accord. If not, then in order to continue the burning process, outside heat must be used. When an air-gas mixture burns, the temperature of ignition is maintained through the rate of flame combustion, that is, the gas burns so rapidly that the heat lost through radiation is made up by the heat developed during the burning process and the fuel is kept at the ignition point. If the flame propagation velocity were too slow, the chemical reactions of combustion would be apt to take place too slowly to develop sufficient heat to keep the fuel at the ignition temperature. The result would be that the fuel would not burn unless some other source of heat were supplied to it or else some more rapid burning combustible added to it. Then, again, it is possible that the rate of flame propagation may be fast enough to keep the fuel burning but not sufficient to develop the heat at the proper speed to produce a maximum temperature in the flame. This, then, would mean that the available heat in the fuel would not be utilized to the best advantage.

Furnace Capacity and Rate of Flame Propagation

The rate of flame propagation is important from the standpoint of the capacity of the furnace in which the fuel is burned and the efficiency of the furnace as a heating medium. The time element is always important in industrial operations, and we have shown above that as far as thermal efficiency is concerned, the more rapid the temperature transference the greater the efficiency of the furnace and the greater its capacity. It is evident that if one gas will burn with twice the velocity of another, that is, if the rate of flame propagation in one is twice as great as that in the other, the heat of the first gas will be evolved in half the time as the heat of the second. Hence, if both gases have the same initial, inherent heating values, it is clear that the heating

can be conducted with twice the rapidity in the first case as in the second. This means, when all other conditions remain constant, that the capacity of the furnace is doubled when the gas of higher flame velocity is used. There are more heat units available within unit time to do the work in the furnace and not only does this mean that the output of the furnace will be greater, in reality twice as large, but the efficiency will be increased as well.

It is thus evident that it is important to know the rate of flame propagation of a fuel or a gas before it can be recommended for a particular purpose in preference to another gas. Inasmuch as manufactured gas is constituted of various gases, it is necessary to know the rate of flame propagation of each of these gases before it is possible to determine the velocity of combustion of the gas itself. The rate of flame propagation varies, of course, in accordance with the composition of the gas-air mixture, and there is a gaseous mixture containing an excess of the gas generally, which will have a maximum rate of flame propagation.

Rate of Flame Propagation of Different Cases

But of more importance than the composition of the gaseous mixture is the nature of the gas. If a volume of hydrogen and air in certain proportions, contained in a suitable container, is ignited and the rate of flame propagation is measured, it will be found to be much greater than that observed when an equal volume of carbon monoxide and air in similar proportions is ignited. In fact hydrogen has the highest rate of flame propagation of any gas. Each gas is characteristic in possessing its own rate of flame propagation. Of all the gases known, that is, the so-called primary gases, carbon monoxide has the lowest rate of flame propagation. Thus it is evident that if we want a manufactured gas of the highest rate of flame propagation, the proportion of hydrogen in it must be a maximum. The gas which contains more hydrogen will generally have a higher rate of flame propagation.

There are other gases contained in manufactured gas, such as methane, ethylene and small quantities of other hydrocarbons. These gases are more complex than the primary gases, hydrogen and carbon dioxide. The distinction is that the two latter gases burn without decomposing, hydrogen giving water and carbon monoxide giving carbon dioxide. Methane and ethylene must be decomposed before they will burn. For this reason their rate of flame propagation is low with respect to hydrogen. It is a fact that as the hydrocarbon becomes more complex, possessing a greater molecular and a greater relative weight, the rate of flame propagation becomes slower. When the hydrocarbon is complex and heavy enough, it is no longer a gas, but a liquid. The rate of flame propagation of a liquid is, of course, very low.

HOW SMALLER IDEAS MAKE FOR SUCCESS

(Continued from page 551)

of prize offers. An offer of $5 or $10 for the best suggestion of the week often brings out ideas worth many times that. People like to earn extra money. They also like the local prestige the winning of such a prize will give them.

Sure Ways to Make More Sales

"We now come to an important component part of any well organized advertising campaign, that may be profitably discussed in detail. It is the direct connecting link between the manufacturer and the retailer. It is more than that, it is the clearing house for all the successful retail selling ideas that are being used today all over the United States. Some call this link a 'house organ.' It should be more correctly termed, 'Sure Ways to Make More Sales.' I am now going to refer to one eminently successful house organ. I say 'successful,' for, as you may not know, all house organs are not 'successful.' I think every one here is familiar with this particular publication. It is the 'Magic Chef,' edited and published by the American Stove Company. This house organ has done more to increase sales for agents than any other factor, except the national advertising.

National Advertising Campaign of American Stove Company

"I have tried to keep away from a subject that is most interesting to me. However, in bringing it to your attention I don't feel that I am trespassing, for from a business standpoint it should be of mutual interest. I will now give you a brief outline of American Stove Company's national advertising, for I know that you have little conception of its magnitude or of its great national influence. And since it is being carried on, day in and day out, in order that it may help you to sell more Lorain-equipped Gas Ranges, and since every gas company profits in direct proportion as does the company, why should we not discuss it briefly? I am sure that all of you who handle these stoves can carry on your sales efforts with better results if you know exactly what you are tying up to.

"Now to indicate briefly some of the substantial elements that have been generated as a direct result of this big national advertising campaign. First, the total yearly amount of newspaper advertising now done by the agents and dealers is twenty times the size in dollars and cents that it was two years ago; second, there has been inaugurated a special and comprehensive advertising campaign in the most influential trade journals. This campaign is one of the most extensive of its kind ever conducted; third, a continuous campaign is now running in the leading architectural and building magazines; fourth, there are in continuous operation completely equipped industrial Research Kitchens, among the finest in the United States, under the direction of one of the

country's best domestic science experts. These kitchens employ every scientific device known to domestic science research. From these kitchens are constantly issued carefully prepared recipes and menus giving the exact time and temperature for cooking. These recipes are advertised in the national advertisements. Interested readers may obtain them by filling-in and mailing coupons in the advertisements. A special department is maintained for the answering of these requests. Hence a national distribution of this educational literature is achieved; fifth, bulletins embodying the expert findings of these Research Kitchens are mailed regularly throughout the year to every school and university in the United States that has a domestic science department; sixth, nearly one thousand domestic science departments in public schools are now equipped with Lorain stoves. Also big commercial institutions use these ranges; seventh, an active campaign of co-operation with the women's leading national magazines is in force for the promotion of the use of Time and Temperature in all published recipes and menus; Electric Signs, Window Trims, Newspapers Give Dealers Much Free Publicity."

"BEAUTY IS ONLY SKIN DEEP"

No, this is NOT a beauty contest. The open season for selecting the most beautiful girl in a one-piece bathing suit is now over and the moving picture companies have curtailed expenses to the point where Eugene O'Brien and Douglas Fairbanks no longer send their autographed photos free of charge. While a contest for the selection of the best looking man in the gas industry might be interesting we, at the present time, are too busy to undertake it.

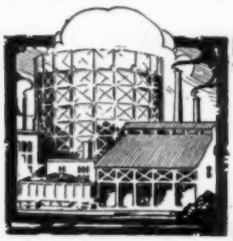
However and notwithstanding, we are this week running pictures of two Popular Portland Gas Men, and the reason for this novel and unusual procedure is simply this:

On October 17 we printed a cartoon of George L. Meyers and under it appeared the caption, "John H. Hartog." To add insult to injury, on October 19, we printed an excellent likeness of George L. Meyers with the caption "John H. Hartog."

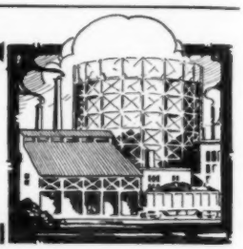
As stated above, we are not running a beauty contest. We made a mistake and we most willingly and gladly acknowledge said mistake. We are glad to print the two cuts again with the right captions under them—take your choice, girls—the line forms to the right.

John H. Hartog, Sales Manager
Portland Gas & Coke Company

Geo. L. Meyers, Assistant to the President
Portland Gas & Coke Company



NEWS OF THE GAS INDUSTRY



Illuminating Engineers Devote Meeting to Gas Lighting

The meeting of the New York section of the Illuminating Engineering Society, which was held on Thursday evening, November 8, 1923, in the Auditorium of the Consolidated Gas Company building, New York City, was devoted to gas lighting.

The first speaker of the evening, Dr. H. S. Miner, chief chemist of the Welsbach Company, Gloucester, N. J., gave a very interesting account of the historical development of the gas mantle. He showed how Dr. Auer, who was afterwards made Count of Welsbach, working on a purely scientific problem, happened to get the idea that certain rare earth salts would retain in skeleton form the shape of an original fabric which was afterwards removed by burning. The important point that was brought out in the talk was that sometimes, in fact, a great many times, purely scientific research, with apparently no evident commercial or industrial value, will result in developments of the highest importance. The value of such research is, and should be, evident to the executives of industries, taking their cue from the success of the Welsbach mantle.

An Entertaining Interlude

A very amusing and entertaining little sketch, entitled "History of Light," was then presented by a number of the employees of the Consolidated Gas Company. Their musical and histrionic talent were very evident, and the songs were very cleverly written and well sung. The sketch purported to depict the story of the development of lighting from the very earliest times up to the present. Aptly enough, the first performer to step upon the stage was dressed in the costume of an Indian chief and held a pine torch in his hand, singing a song about the use of the latter to light up a pow-wow between whites and Indians to smoke the pipe of peace. This singer was supported by a chorus of four, as was every other number following.

The next number was sung by an Eskimo, dressed from head to foot in furs, carrying a tallow light, while he was followed by a Colonial gentleman, very finely dressed in what used to be the latest style of those days, with silken garments and powdered wig. He carried an old square lantern and sang about the way he used to carry that around the streets of the city at night to light his way from place to place.

The next gentleman to come upon the stage told the story of the kerosene lamp. He was dressed in the costume of a farmer, with big heavy boots, large straw hat, long duster coat, etc., and in all he was a rather typical specimen, and the song told of the use of the kerosene lamp.

Next came a gentleman, very cleverly and amusingly costumed in the garb of an undertaker, with a long Prince Albert coat and high hat. Fastened around his waist was a gas container, and held in his hand was the old flat flame burning with a very feeble light. His song, which was supported by a chorus of four undertakers, similarly dressed, was sung in lugubrious tone, and told the end of the old flat flame.

In the final number of the entertainment the entire stage was used to tell the advantages and benefits of the C. E. Z. light. The whole affair was admirably well presented and was really amusing. The entertainment was thoroughly enjoyed by all present, as was evidenced by the appreciation shown by the audience.

The rest of the meeting was given up to two talks, one on the development of luminaries by G. P. Norton, vice-president and general manager of Edward Miller & Co., Meriden, Conn., and the development of illuminated glassware, by E. Y. Davidson, Jr., illuminating engineer of the Macbeth-Evans Glass Company, Pittsburgh, Pa.

Reports Gain in Customers

Pacific Gas and Electric Company (Cal.) in the month of September, 1923, made the largest net gain of customers in any single month in its history, and at the close of September was serving a total of 684,527 consumers.

The gain of 39,323 in the nine months to September 30, 1923, exceeded the gain in the preceding nine months' period by 9,895, and the gain of 36,191 customers in the twelve months' period to September 30 exceeded the gain in the preceding twelve months by 16,723.

These remarkable results may be attributed to the great building activity prevailing in substantially all sections of the territory served by the company, to the company's liberal extension policy and to the effective work of the sales organization instituted by President Creed.

Three Part Rate Adopted

Webb City, Mo.—The Webb City Council in session indorsed the installation of a three-part rate for gas here. By the authorization, the local gas company will make application to the State Public Service Commission for the change in rate schedules. The new rate probably will be in effect by December 1.

Third Annual Gas Meter Course at Iowa

The Iowa District Gas Association, in conjunction with the engineering extension department of the Iowa State College, Ames, Iowa, is planning to hold the third annual short gas meter course at the college, from December 4 to 7, inclusive.

At the 1922 course there were about seventy men registered. It was reported that the results obtained from both the first and second short meter courses were very gratifying, and the methods of instruction of carrying on the bench work, lectures, etc., will be further improved this year.

H. R. Sterrett, secretary-treasurer of the Iowa District Gas Association, Des Moines, Iowa, requests that every one expecting to attend the course this year should notify him. There is no fee attached to the course, the only expense being traveling and hotel charges.

On Thursday, December 6, the officers and council of the Iowa District Gas Association will meet at Ames, Iowa, to take up association matters, including the time, place and program of the 1924 convention. Mr. Sterrett states that by holding the council meeting at Ames during the period of the short meter course it will be possible to show the men attending the course that the Iowa District Gas Association is enthusiastically backing it, and at the same time will serve as a means of showing the officers and members of council just how the course is conducted.

The following is the tentative program for the course and the personnel of the committee in charge of same:

Tuesday, December 4, 1923

8:30-10:30—Registration. Outlines of course—D. P. Allen, Chm. G. M. S. C., I. D. G. A.

10:40—Meter shop practice. Tin Case Meters. Procedure for testing meters, George A. Lane, superintendent of meters, Peoples Gas Light and Coke Co., Chicago, Ill., assisted by Wm. Rosenia, meter department, Peoples Gas Light and Coke Company, Chicago, Ill. Classification of Repairs: (a) O. K., (b) Readjust, (c) Partial, (d) General, (e) New Diaphragm, (f) Gassing, (g) Four Pointing, (h) Adjusting, (i) Topping, (j) Painting and O. K. stock.

Note: This will cover the subject in detail and the balance of the day will be devoted to it. Smoker in the evening. Guests of Ames Chamber of Commerce.

Wednesday, December 5, 1923

Meter shop practice. Tin case meters. General discussion. Meter shop practice — Sprague meters, Mr. C. J. Hauschildt, inspecting engineer, United Lt. & Rys. Co., Davenport, Iowa, and Mr. E. Wortham, meter shop foreman, Peoples Light Company, Davenport, Iowa.

Afternoon Session: Section A—Prover and repair bench practice. Section B—Meter shop practice, general. The manufacture of meter diaphragms. Meter diaphragm lubrication. The use of complaint meters. No evening program.

Thursday, December 6, 1923

Morning session: Section A—Optional, prover and repair bench practice, or with Section B—Meter records. Paper followed by general discussion. Robert F. Galpin, superintendent of distribution, Muscatine Lighting Co., Muscatine, Iowa.

Afternoon session: Section A—Optional, prover and repair bench practice, or with Section B—Question box, Geo. A. Lane, chairman. Discussion, meter shop practice.

Evening: Banquet—J. H. Ainsworth, chairman, manager Public Service Co., Ames, Iowa. H. R. Sterrett, secretary-treasurer I. D. G. A., toastmaster.

Friday, December 7, 1923

Morning session: Section A—Prover and repair bench practice. Section B—Meter handling and selling, C. S. Stahl, assistant manager Peoples Light Co., Davenport, Iowa. House governors, D. P. Allen.

Afternoon session: Section A—Prover and repair bench practice. No evening program.

Note: Section A—For men desiring instruction and practice in meter testing and adjusting. Tools and all necessary facilities will be provided for practical prover and repair bench work on both tin case and Sprague meters. Mr. Geo. A. Lane, superintendent of meters, Peoples Gas Light & Coke Co., Chicago, Ill., will have general charge of this practical work. Mr. Alfred T. Barrett of the American Meter Co., Chicago, will have charge of the instruction in tin case meter proving and repairing and will be assisted by Mr. Frank Kepschull of the American Meter Co. and by experienced tin case meter repair men from the various meter shops in the district. Mr. E. C. Falvey, representative of the Sprague Meter Co., will have charge of the instruction in Sprague Meter proving and adjusting and will be assisted by experienced Sprague meter repair men from the various meter shops in the district.

Section B—For all those attending the course not desiring work as outlined in Section A, it is planned to make the papers and discussions general enough to be of interest and value to the various managers, engineers, superintendents and other men in executive capacities that attend the course.

Third Annual Short Meter Course Committee: D. P. Allen, Des Moines Gas Co., Des Moines, Iowa, chairman; Geo. A. Lane, Peoples Gas Light & Coke Co., Chicago, Ill.; D. C. Faber, director engineering extension department, Iowa State College, Ames, Iowa; L. V. Hein, electrical engineer, Technical Information Bureau, Iowa State College, Ames, Iowa; A. T. Barrett, American Meter Co., Chicago, Ill.; E. C. Falvey, Sprague Meter Co., Davenport, Iowa; C. R. Stahl, Peoples Light Co., Davenport, Iowa; R. F. Galpin, Muscatine Lighting Co., Muscatine, Iowa; H. R. Sterrett, Des Moines Gas Co., Des Moines, Iowa.

Employees Discuss Production Problems

The Equitable Employees Association, whose membership is composed of employees in all departments of the Equitable Gas Company, Pittsburgh, Pa., held its first fall meeting of the general discussion and lecture course at the company's laboratory.

Mr. M. C. Schneider, general superintendent of production and transportation, gave a talk on our "Production Problems," illustrated by means of charts, maps and a motion picture film.

Educational plans for the coming season were discussed at this meeting.

At the second meeting in the course, Mr. H. C. Adams, gasoline engineer, is to speak on the "Extraction of Gasoline from Natural Gas," telling something of the gasoline plants now operated by the Equitable Gas Company.

Keith Spade Head of Department of Public Speaking

Chicago, Ill.—The Illinois Committee on Public Utility Information announces the appointment of Mr. Keith Spade as director of its department of public speaking, known as the Public Service Speakers Bureau.

Mr. Spade has resigned as secretary of the Monmouth Chamber of Commerce to assume his new duties.

Requests from commercial, civic and other organizations for speakers on public utility subjects should be directed to him at the bureau's offices, suite 836, at 125 South Clark street, Chicago.

Peoples Gas Company Takes New Manager

Marshfield, Wis.—At a meeting of the directors of the Peoples Gas Company, Arthur Zertler of St. Cloud, Minnesota, was chosen manager to succeed John Verig, resigned. Mr. Zertler is an understudy, so to speak, of Mr. Verig, as he was his assistant during his management of a gas plant in St. Cloud before coming to this city.

Mr. Verig will go from here to Manitowoc, where he will have the management of a gas plant there.

Organizes Home Economic Dept.

Coney Island, N. Y.—The officials of the Brooklyn Borough Gas Company have organized a Home Economic Department for the benefit of its thousands of consumers at Coney Island and the adjoining sections.

Although in operation but a short time, more than 150 housewives are taking advantage of its opportunities and are attending the sessions held by the gas company management.

Marjorie E. Pidgeon

Miss Marjorie E. Pidgeon of 2215 Surf avenue is in charge of the Home Economic Bureau, which has been established at the company's King's Highway branch, Kings Highway and East Twelfth street.

Every afternoon at 2 o'clock Miss Pidgeon addresses the gathering of housewives and gives short talks on home economics, touching on operations of the various gas appliances and the different methods of conserving and saving of fuel. Classes are being formed, and at these Miss Pidgeon will go into detail of methods to be used in the preparing and the cooking of different foods by the use of gas.

It is the intention of the officials of the gas company to conduct these class lectures throughout the winter, both at its main office at Coney Island as well as its branch offices.

Appointed Chief Engineer

Des Moines, Iowa—Announcement has been made of the appointment of Thomas J. Lucas as chief engineer for the Illinois Power and Light Corporation, which has extensive properties in Iowa. Another announcement is to the effect that E. S. Hight has been appointed operating engineer for this big corporation.

The Illinois Power and Light Corporation was formed this year by the consolidation of numerous public utilities of the middle West. Among its Iowa properties is the Des Moines Electric Company.

Mr. Lucas is an electrical and gas engineer of many years' experience and has been associated with the William A. Baehr organization, consulting engineers, for fourteen years. Mr. Hight has been chief operating engineer for the Illinois Traction Company for many years.

Thomas P. Anthony Appointed Chief Engineer

The United States Cast Iron Pipe and Foundry Company announces the appointment of Mr. Thomas P. Anthony as chief engineer of the company, with offices at Burlington, N. J.

Mr. P. T. Laws has been appointed Southern District manager of the company. Mr. Laws will be located at 1002 American Trust and Savings Bank Bldg., Birmingham, Ala.

L. A. Gas Continues to Gain in Earnings

Los Angeles, Cal. — Earnings statement of the Los Angeles Gas and Electric Corporation, released through Bond & Goodwin & Tucker, Inc., shows gross earnings for the month of September of $844,121.33, or an increase of $70,014.40 over August. Net earnings were $356,660.12, or $53,204.71 greater than in August. The year ended September 30, 1923, shows a balance for dividends and surplus of $2,073,331.24.

Yacht Club Out on Lake Michigan Supplied with Gas

Flexible Connection Feature of New Installation

The Chicago Yacht Club, located in the harbor at Lincoln Park, off Belmont avenue, Chicago, Ill., is the scene of the latest and one of the most unusual installations of gas the Peoples Gas Light and Coke Company, Chicago, Ill., has made so far, according to Peoples Gas Club News.

Gas service is supplied to the clubhouse by means of a flexible connection from the shore line to the house itself out on Lake Michigan.

To accomplish this job required the laying of 525 feet of gas main to the shore line. From that point 100 feet of four-inch service pipe was laid on brackets alongside a boardwalk which extends from the shore. There the service pipe ends and a flexible connection is used to connect with piping inside the clubhouse.

This flexible connection of rubber hose allows for any movement of the barge through action of the wind and waves. The gas meter is set on the lower deck of the clubhouse.

A gas-fired Bryant water heater is connected to a 300-gallon tank, which supplies hot water for the kitchen, three showers and ten lavatories. This heater is thermostatically controlled and automatic in operation, keeping 300 gallons of water heated to a temperature of 140° Fr.

The dining room of the clubhouse will accommodate 400 guests at one time and the kitchen equipment, on which gas is used exclusively, consists of one two-section hotel range, one two-piece battery of coffee urns, one broiler and a five-foot steam table.

It is estimated that these installations will add 600,000 cubic feet every month.

This beautiful floating clubhouse is a two-deck wooden structure, built on a steel barge. The lower deck is used for sail locker rooms and clothes lockers. On the second deck is located the kitchen, dining room, lounging room and the promenade. The building is 150 feet long, 50 feet wide and has a displacement of 750 tons.

It is the home of the Chicago Yacht Club and has a membership of 1,700. There are 200 boats in the fleet, made up of sailboats, power boats and steamers.

The plans for this clubhouse were drawn in the office of George B. Nimmons & Co., one of Chicago's leading architects, and the mechanical features were in charge of A. C. King, consulting engineer.

Utilities Buy Rome Gas & Electric Company

F. L. Carlisle & Co., Inc., of No. 49 Wall street, announce the purchase of the entire common stock of the Rome Gas & Electric Light & Power Company, Rome, N. Y., by the interests owning the Northern New York Utilities, Inc., and the Power Corporation of New York. These companies do the major part of the gas, electric light and power business of Northern New York and wholesale power to the Utica Gas & Electric Co.

Application will be made shortly to the Public Service Commission for permission to merge the Rome Gas & Electric Light & Power Co. with the Northern New York Utilities, Inc.

The Rome company was purchased from the National Gas, Electric Light and Power Co. of Philadelphia, Pa. The purchase price was not stated. The Rome company furnished gas and electricity in the city of Rome, which is an important manufacturing center, particularly in the copper and brass business.

The following have been elected as the new officers of the Rome company:

John N. Carlisle, president.

H. G. Davis, vice-president.

Johnson D. McMahon, vice-president.

Roy K. Ferguson, vice-president.

Fred A. Rogers, secretary and treasurer.

S. F. Smith, assistant secretary and treasurer.

The new organization has taken possession of the company and plans have been made for the additional power requirements necessary not only to take care of the Northern New York territory, but also for the Rome Company.

Issues Permits for Gas Distribution

Under an order of the Public Service Commission, issued November 7, the commission permits and approves construction by the Orange County Public Service Company, Inc., of a system for the distribution of gas and electricity in certain municipalities in Orange county, and also approved the right to exercise franchises which had been transferred to it by the Orange County Public Service Corporation and the Orange County Hydro-Electric Corporation.

Gas Schedule Approved by Public Service Commission

Adirondack Light and Power Corporation, supplying gas service in cities of Glens Falls and Oneida, villages of Fort Edward, Hudson Falls and South Glens Falls, towns of Ford Edward, Kingsbury, Moreau and Queensbury, N. Y., has filed schedules to become effective November 22, 1923, providing new classifications for use of service for residence heating (limited period, between October 1 and April 13 following). Rate is as follows:

Primary rate: For first 400 C. F. of gas used per 1,000 C. F. of building volume, $2.15 per M. C. F. Secondary rate: For first 5,000 C. F. in excess of that paid for at the primary rate, $1.25 per M. C. F.; for the next 5,000 C. F., $1 per M. C. F.; for additional use per month, 80c per M. C. F. Minimum charge computed for the use of 400 C. F. of gas for each 1,000 C. F. of building volume.

Stock Offered for Sale

Savannah, Ga.—Seven per cent preferred stock of the Savannah Gas Company was offered for sale to customers of the company and residents of Savannah. The board of directors of the company has authorized the issuance of $450,000 of 7 per cent cumulative preferred stock, $200,000 of which has already been sold for cash at par, $25 per share, and $250,000 of which is now offered.

This stock is part of the issue of securities authorized by the Georgia Public Service Commission in its order dated August 29, 1923, to be used in retiring the company's then outstanding indebtedness and for capital expenditures required in the development of the business. It represents actual physical property used in rendering gas service to this community.

The company feels that its customers should be more interested than anyone else in the conduct of its business, because they are constantly in touch with it in their daily life and know from experience the comfort and convenience which the service provides for the community. The company, therefore, wishes its customers to become shareholders—part owners. Customer ownership means closer co-operation—a greater understanding of public utility service, and introduces a plan whereby local money, invested at home, earns a return of 7 per cent. The par value of each share is $25. Each customer or local resident can purchase as many shares as desired by paying cash, $25, and accrued dividends for each share. Dividends at the rate of 7 per cent per annum will be payable by check quarterly in September, December, March and June of each year.

So that every investor may avail himself of this opportunity, the company will take subscriptions on the time payment plan, $2.50 down per share, the balance payable $2.50 per month per share. Not more than 40 shares will be sold to any one individual on this basis. The purchaser will have the right to complete the payments more rapidly. Interest at the rate of 6 per cent per annum will be allowed on payments received until the stock is fully paid for.

The capitalization of the company, as recently authorized by the Georgia Public Service Commission, is as follows:

First mortgage 6 per cent bonds	$600,000
Seven per cent preferred stock	450,000
Common stock	1,400,000
Total	$2,450,000

The new capitalization represents a reduction in bonded indebtedness from $1,515,000 to $600,000, with a consequent reduction in interest charges and a corresponding increase in net income applicable to the payment of dividends on the preferred stock.

After payment of operating expenses, taxes, interest on bonds, etc., and after setting aside proper allowance for renewals and replacements, the net income of the company for the twelve months' period ended August 31, 1923, applicable to the payment of dividends on the $450,000 of 7 per cent cumulative preferred stock which will be outstanding after the sale of $250,000 of stock now offered, was $147,472, or 4 6-10 times the dividend requirements.

For the last eight years such average net income has been more than two and one-half times the requirements to pay the dividend on this issue of preferred stock.

This issue of preferred stock has preference over the $1,400,000 common stock of the company now outstanding; no dividends can be paid on the common stock until quarterly dividends at the rate of 7 per cent per annum shall have been paid or set aside for payment on the preferred stock.

Wants New Valuation on Property

Atlanta, Ga.—The Georgia Railway and Power Company and the Atlanta Gas Light Company, on Saturday, November 10, filed a motion with the Georgia Public Service Commission asking a final disposition of the noted Atlanta gas case, which recently was decided against the Atlanta company by the United States Supreme Court when the court upheld the reduction in rates ordered by the Georgia commission in December, 1921, and effective from January 1, 1922. The reduction in rates was ordered at the time by the commission, following an exhaustive survey having to do with the valuation of the gas company's properties in Atlanta, and the rate decided upon was, according to the commission's valuation on the properties, a fair return. But the gas company has always contended the valuation was entirely too low, and the new move made by the company seeks to have the properties surveyed again, or rather to have the previous survey carefully reviewed by the commission before it renders a final decision in the gas case. What the result will be remains, of course, to be seen, but should the new valuation represent what the gas company officials contend it should, it would have an important effect on the future gas rates.

In the meantime the Atlanta company is preparing to refund the difference in rates to consumers in Atlanta and suburbs, representing about 10 cents per 1,000 cubic feet consumed over a period of almost two years, the total amounting to about $250,000 that will take a big slice out of the gas company's profits the past two years.

Asks Permission to Issue Bonds

Atlanta, Ga.—In order to carry out certain improvements to its properties at Waycross, Ga., the Ware County Light and Power Company, operating the gas and other public utilities at that city, has filed a petition with the Georgia Public Service Commission asking permission to issue $180,000 in bonds. The money will be used to partially replace the sum of $280,000 the company has invested in improvements the past few years and for additions to the properties and for the carrying out of other improvements planned.